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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/812,617	03/19/2001	Jianhua Wang	OPT-101	1319

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EXAMINER
SUCHECKI, KRISTYNA

ART UNIT	PAPER NUMBER
2882	

DATE MAILED: 08/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/812,617

Applicant(s)

WANG ET AL.

Examiner

Krystyna Suchecki

Art Unit

2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-4, 10-12 and 14 is/are allowed.
- 6) ☒ Claim(s) 5-9, 13, 15, 16, 18 and 19 is/are rejected.
- 7) ☒ Claim(s) 15 and 17 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Objections

1. Claims 15 and 17 are objected to because of the following informalities: The claims both designate definition for variables "R" and "d", which conflict. This is improper. Only one definition for each variable should be used. Other variables should be assigned for the remaining definitions. Amendments to the equations shown should also be made. Please ensure the specification matches the definitions and variables. Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 5-9, 13, 15-16 and 18-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Chande (US 4,838,631).

4. Regarding Claim 5, Figure 5 of Chande teaches an optical switch comprising an optical input (item 308 shows an input path) for receiving a light beam (302); a galvanometer-driven, rotatable-mirror x-y scanner (326, 330) optically coupled to the optical input, for directing the light beam to one of a plurality of directions (Column 8, lines 41-43); and an array (314, 312) of output collimators being aligned with one of the directions so as to receive the light beam when directed by the x-y scanner.

5. Regarding Claim 6, by teaching a substantially spherical arrangement of outputs in Figure 2 and then applying the teaching of Figure 2 to Figure 5, Chande teaches the output surface having a substantially spherical curvature.
6. Regarding Claim 7, Chande teaches the output surface defined substantially by a constant optical path condition accounting for a dependence of an optical path corresponding to each direction on an orientation of the x-y scanner (See particulars of Figure 5).
7. Regarding Claim 8, Figure 5 Chande teaches an optical switch comprising an optical input (item 308 shows an input path) for receiving a light beam (302); a galvanometer-driven rotatable-mirror x-y scanner (326, 330) optically coupled to the optical input, for selectively directing the light beam to one of a plurality of output paths (Column 8, lines 41-43); and an array of optical outputs (304) capable of optical communication with the x-y scanner and aligned over an output surface, each of the optical outputs being aligned with one of the output paths so as to receive the light beam when directed by the x-y scanner.
8. Regarding Claim 9, Figure 5 Chande teaches an optical switch comprising an optical source (Laser Source) for generating a light beam (302); an optical switch in optical communication with the optical source, for receiving and directing the light beam, the optical switch comprising: an optical input (308) optically connected to the optical source, for receiving the light beam, a galvanometer-driven, rotatable-mirror x-y scanner (326, 330) optically coupled to the optical input, for selectively directing the light beam to one of a plurality of output paths (Column 8), and an array of optical outputs (314, 312) capable of optical communication with the x-y scanner, each of the optical outputs

being aligned to one of the output paths so as to receive the light beam when directed by the x-y scanner; and an array of optical receivers (304) each optically connected to a corresponding optical output, for receiving the light beam when directed by the x-y scanner to the corresponding optical output.

9. Regarding Claim 13, Chande teaches an optical switching method comprising the steps of: receiving a light beam (302); controlling a galvanometer-driven, rotatable-mirror x-y scanner (326, 330) to selectively direct the light beam to one of a plurality of output paths; and receiving the light beam at a selected one of an array of optical outputs aligned over a concave output surface (See particulars of system 100 as applied to system 300 and Column 10), each of the optical outputs being aligned with one of the output paths so as to receive the light beam when directed by the x-y scanner (Column 8, lines 39-63).

10. Regarding Claim 15, Chande teaches a method comprising an array of optical outputs arranged over an output surface having a substantially spherical curvature of a radius valued between R and $R+d$, wherein R is an optical distance between the x-y scanner and the output surface, and d is a distance between a first scan axis and a second scan axis orthogonal to the first scan axis (See particulars of system 100 as applied to system 300 and Column 10).

11. Regarding Claim 16, Chande teaches a method comprising an array of optical outputs arranged over an output surface defined substantially by an exact constant optical path condition accounting for a dependence of the optical path between the optical input and each of the optical output on an orientation of the x-y scanner (See Column 10 and particulars of items "P" and 378).

12. Regarding Claim 18, Chande teaches a method where an array of optical outputs comprises an array of output fiber collimators; and the method further comprises individually aligning each of the fiber collimators with a corresponding output path during an assembly of the array of output fiber collimators (Column 4, lines 65-67, Column 8, lines 39-63 and Column 9, line 53- Column 10, line 22).

13. Regarding Claim 19, Chande teaches a method wherein an array of optical outputs is situated along a curved output surface (Figure 2, as applied to Figure 5).

Allowable Subject Matter

14. Claims 1-4, 10-12 and 14 are allowed.

15. Claim 17 would be allowable if rewritten to overcome the objection set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

16. As allowable subject matter has been indicated, applicant's reply must either comply with all formal requirements or specifically traverse each requirement not complied with. See 37 CFR 1.111(b) and MPEP § 707.07(a).

17. The following is a statement of reasons for the indication of allowable subject matter: Claim 1 contains allowable subject matter because prior art fails to teach or fairly suggest an optical switch with an input fiber collimator with the other claimed limitations of first and second galvanometer arrangements and associated output array. While Chandra teaches certain features, it is not obvious to use the input fiber collimation elements taught by Applicant, since the elements would interfere with the optical power through-put of the source. Claims 2-4 and 14 are allowable by virtue of their dependency. Reasons for allowance of Claim 10 can be found in prior Office Action dated 02/28/03.

Claim 11 is allowable for at least the reason that prior art fails to teach or fairly suggest an optical switch with an array of optical inputs associated with the other elements as claimed. While Chande teaches an input with associated outputs, it is not readily obvious to reverse the system, as it is with many switching devices, to have a plurality of inputs and one output, since this is not suggested by Chande and would lead to unanticipated results. Claim 12 is allowable for at least the reason that prior art fails to teach or fairly suggest a method of optically switching a light beam between at least one input fiber and at least one of an array of output fibers comprising collimation steps and galvanometric rotation and reflection steps as claimed with the other limitations. Claim 17 contains allowable subject matter for at least the reason that prior art fails to teach or suggest the optical path condition as claimed. While Chande places special interest on ensuring a fiber's cone acceptance angle is well matched to a lens' focal length, the specific condition set forth by Applicant is neither taught nor suggested.

Response to Arguments

18. Applicant's arguments, see Amendment, filed 06/27/03, with respect to claims 1-7, 11-12 have been fully considered and are persuasive. The rejection of the claims has been withdrawn. A new grounds of rejection has been applied to claims 5-7 in light of the emphasis on Applicant's inclusion of a galvanometric device.
19. Applicant's arguments with respect to claims 5-9 and 13 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krystyna Suchecki whose telephone number is (703)

305-5424. The examiner can normally be reached on M-F 8-6, with alternating Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Glick can be reached on (703) 308-4858. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4900.



DAVID V. BRUCE
PRIMARY EXAMINER

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August 7, 2003